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Stellingen behorende bij het proefschrift

Adaptation and diversification of
Escherichia coli K12 MC1000 in a complex environment
Pilar Eliana Puentes Téllez

1. The presence of diversification in sympatric conditions can be effectively unveiled by assessing adaptation in bacterial populations, exemplified by *Escherichia coli*, subjected to experimental evolution conditions (*This thesis*).
2. Sequential-batch cultures of *Escherichia coli* K12 MC1000 in Luria-Bertani broth subjected to either continuous aerobic or continuous anaerobic conditions represent a stressful environment to this organism (*This thesis*)
3. Rapidly-emerging differential genomic backgrounds within a bacterial population resulting from adaptive evolution drive the fate of phenotypic innovations within the population (*This thesis*)
4. The diversification observed after 1,000 generations of *Escherichia coli* in a complex medium is the resultant of a combination of chance (drift) and need (selection). (*This thesis*)
5. The nature and multiplicity of substrates that are available in Luria-Bertani broth constitute remarkable driving forces for the adaptation and diversification of the organisms growing in this medium (*This thesis*).
6. Placing a strong focus on the physiological status of members of an evolving bacterial population will elucidate the presence of specific traits and serve as a tool to identify the basis of diversification (*This thesis)*
7. Growth and survival of *Escherichia coli* under the complex and heterogeneous conditions offered by Luria-Bertani broth incite the stable and interactive coexistence of two diverged forms between which specific *trade-offs* exist that involve modulation of either carbohydrate consumption rate or tolerance to environmental stress (*This thesis*).
8. Demonstrating that divergence-without-isolation exists has been one of the toughest nuts to crack in evolutionary biology.
9. Darwin would no doubt have been delighted by the insights that experimental evolution has provided into understanding and applying his big idea: evolution by natural selection. Buckling *et al*., 2009.
10. Sparse but sound experimental evidence of human adaptive evolution can be collected after living during four years in a foreign country.
11. The more you learn about microorganisms and their complexity, the more you will be fascinated by them.
12. Probabilities of a bike not being stolen and a tire not being flat at least once in four years of use still do exist.
13. The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom. *Isaac Asimov*